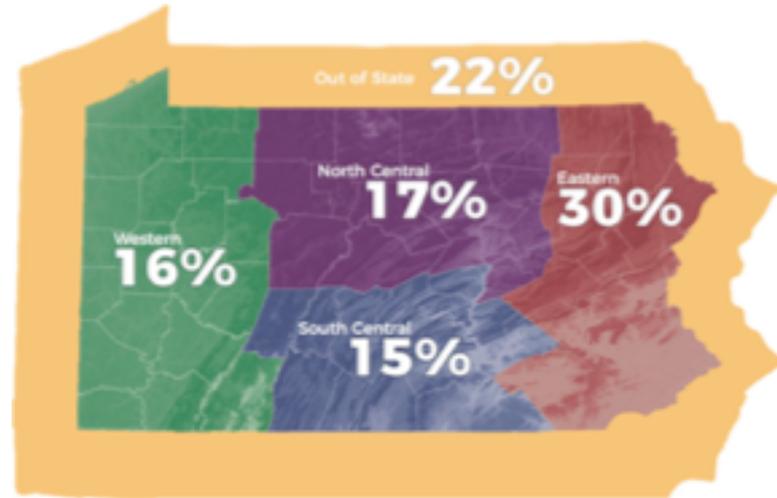
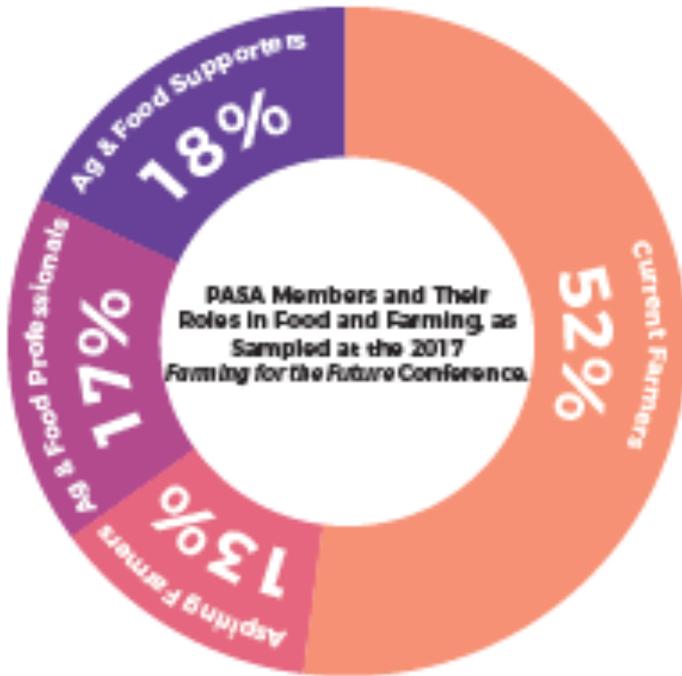


Soil Health Benchmark Study



6,468 Current PASA Members and Supporters



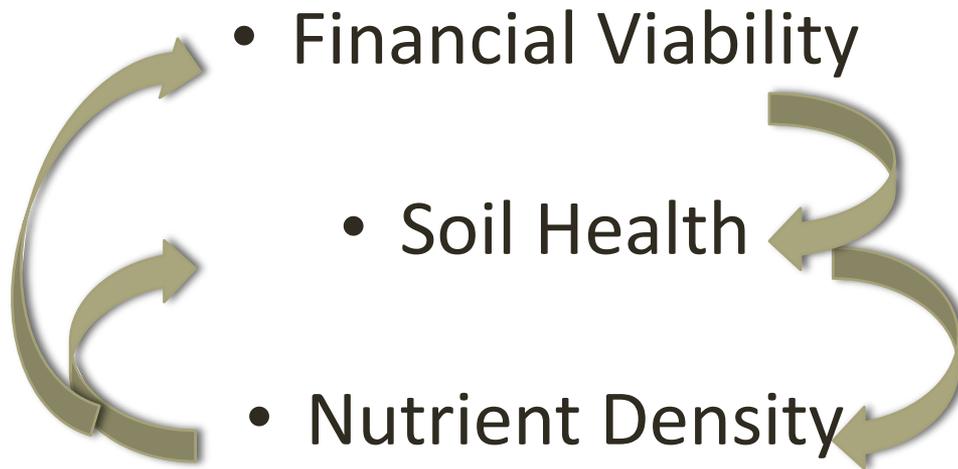
What is Sustainable Agriculture?

PASA Farmers Say:

- Financial Viability
 - Soil Health
- Nutrient Density

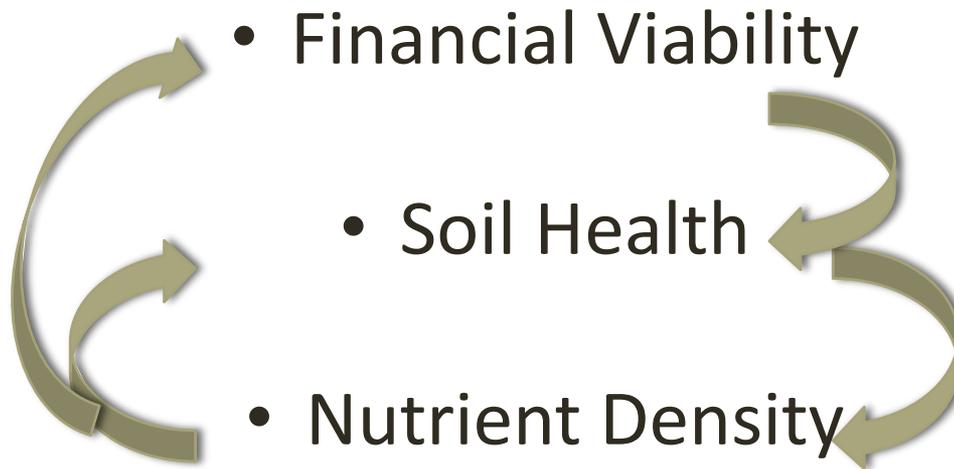
What is Sustainable Agriculture?

PASA Farmers Say:



What is Sustainable Agriculture?

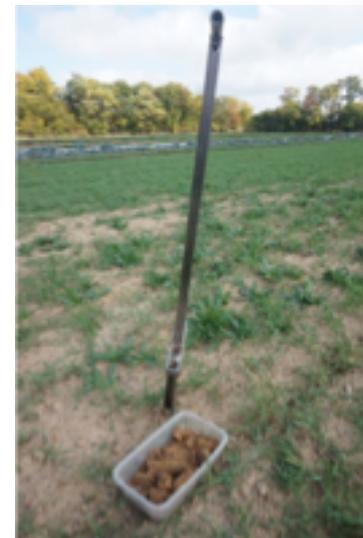
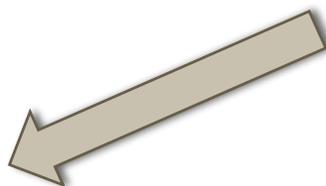
PASA Farmers Say:



Soil Health is also Fundamental to Adapting to Climate Change!

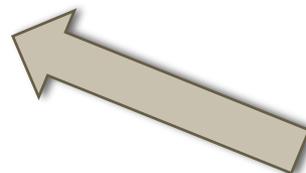
PASA Benchmark Soil Health Study: How are we doing and how can we do better?

FIELD SOIL SAMPLES



FARM RECORDS

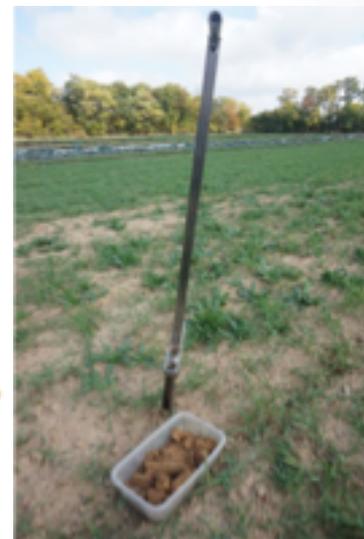
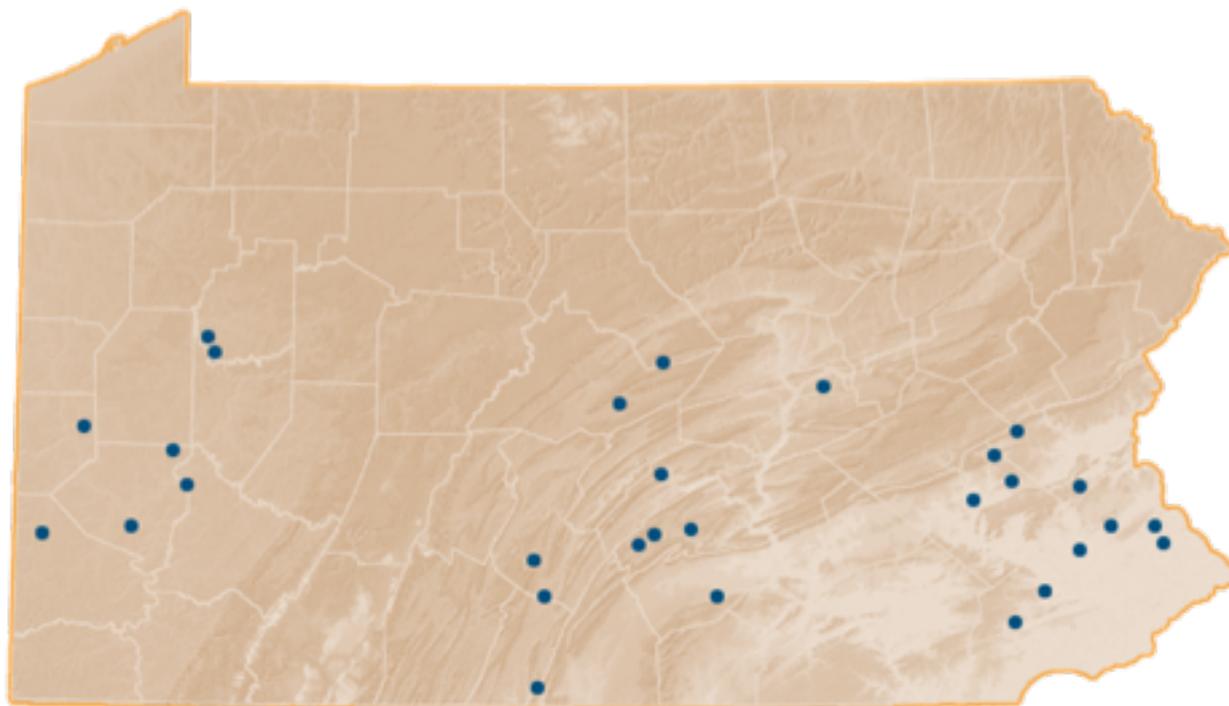
- Tillage and cultivation
- Planting dates
- Soil Amendments



farmOS



PASA Benchmark Soil Health Study: How are we doing and how can we do better?



farmOS



Four Soil Health Principles

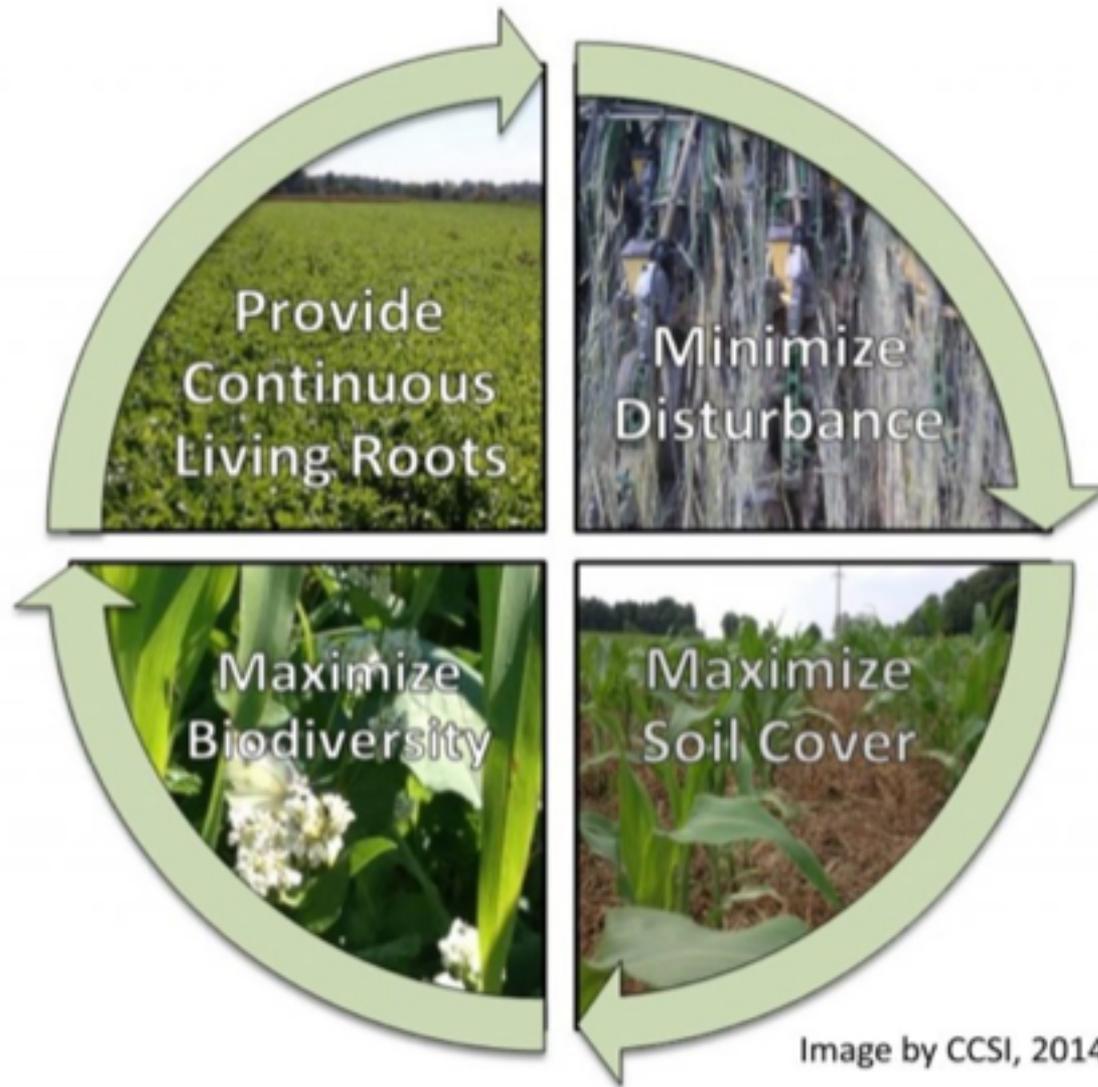
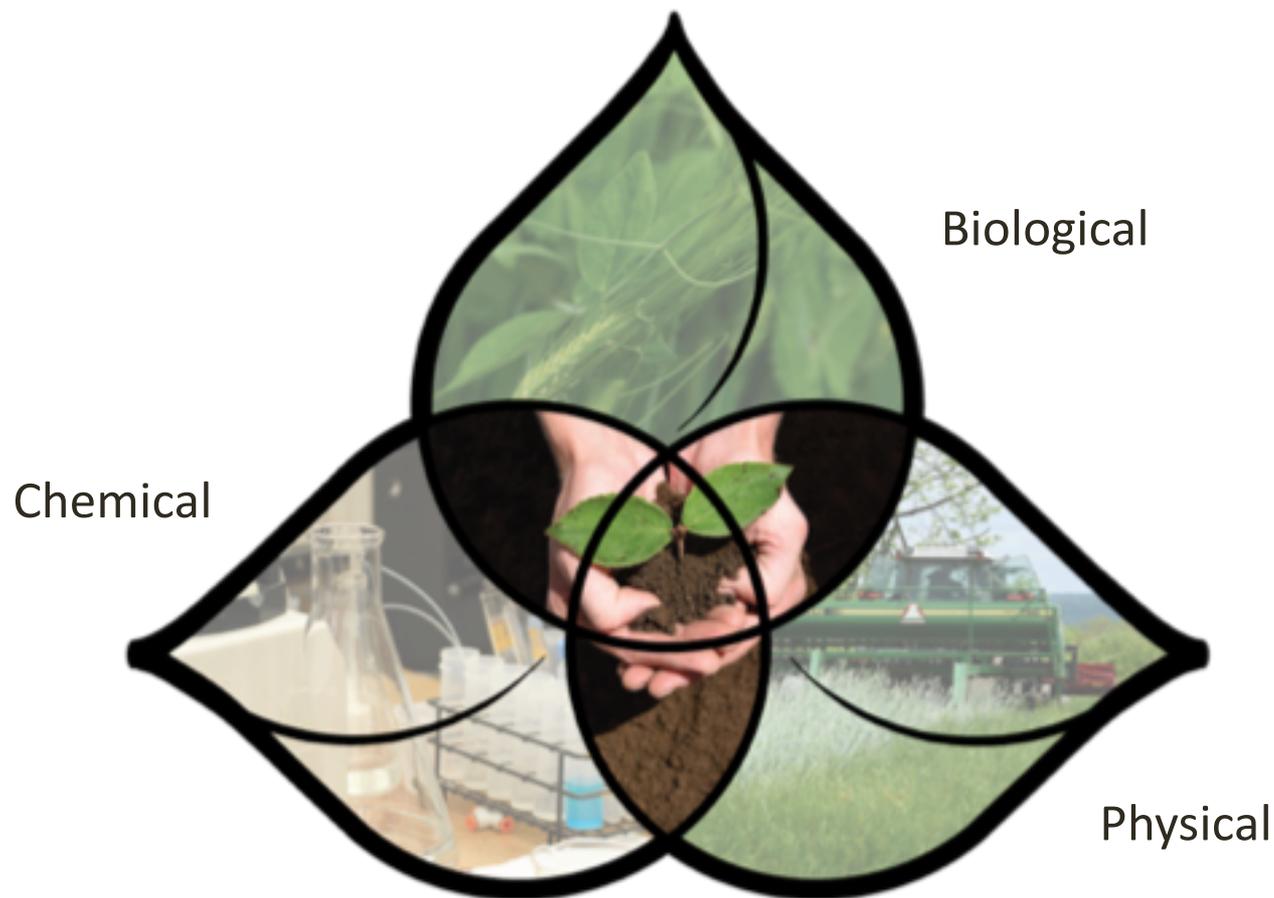


Image by CCSI, 2014

CORNELL COMPREHENSIVE ASSESSMENT OF SOIL HEALTH



Cornell Color Codes **Constrained (0-20)** **Low-Level (20-40)** **Suboptimal (40-60)** **Excellent (60-80)** **Optimal (80-100)**

SOIL HEALTH INDICATORS FROM FARM RECORDS

DAYS IN LIVING COVER



100% living cover



50% living cover

TILLAGE INDEX



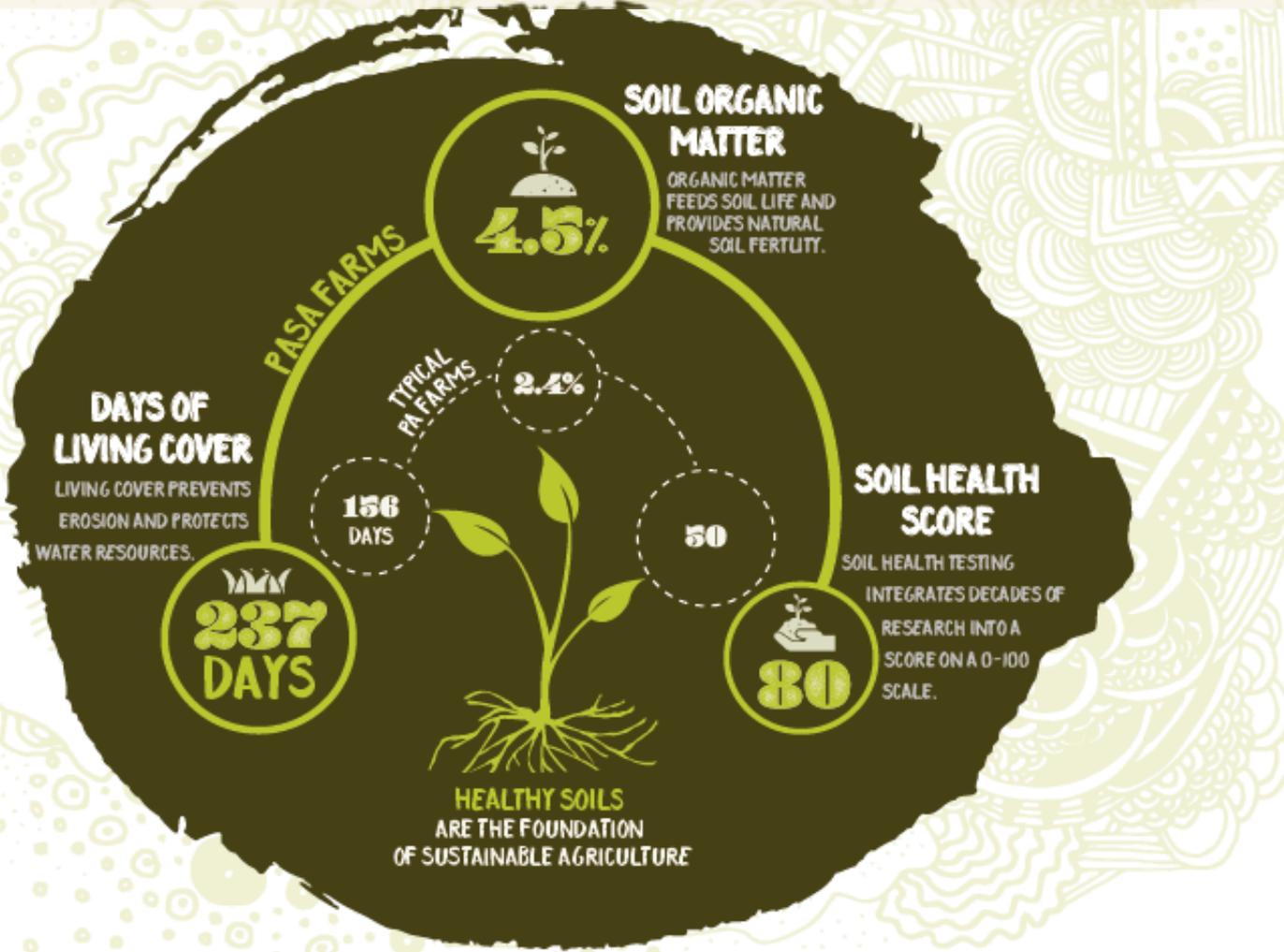
Disc plow = 39.0



Tine Weeder = 7.9

PENNSYLVANIA ASSOCIATION FOR SUSTAINABLE AGRICULTURE

FARMERS **IMPROVE THEIR SOIL**



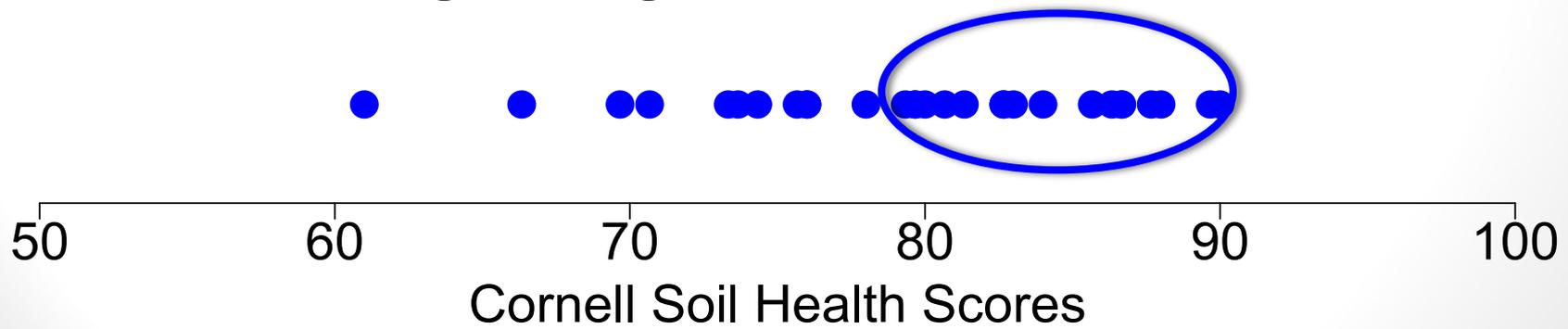
No-Till Grain Farms



Organic Vegetable Farms



PASA Organic Vegetable Farms



PASA SOIL HEALTH CONFERENCE

SEPT 28, 2017

Spiral Path
f a r m



SPIRAL PATH FARM SOIL HEALTH SPIRAL

COMPOST SYSTEMS:
To prime biological fertility.



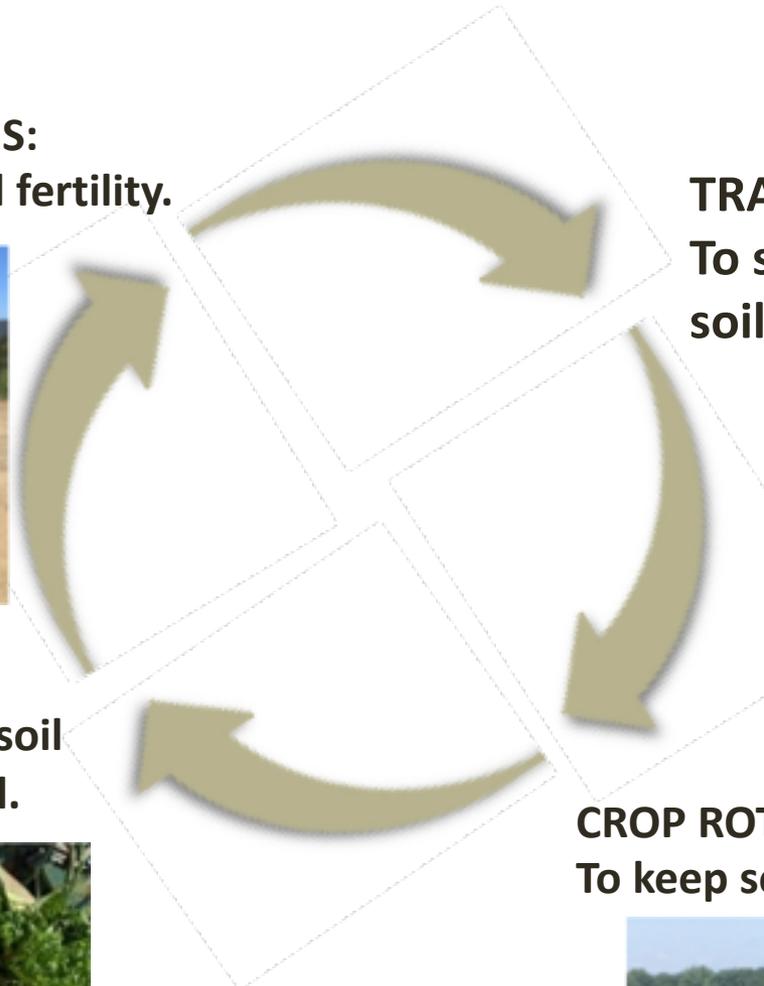
TRANSPLANT HEALTH:
To set crops up to build soil as they grow.



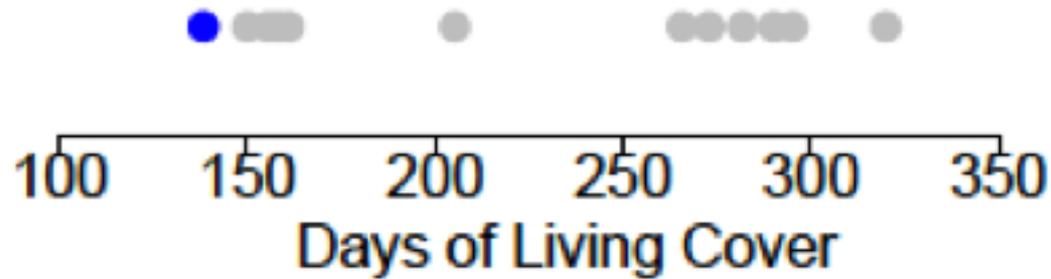
CROP HEALTH:
To optimize crop soil building potential.



CROP ROTATIONS:
To keep soil in living cover.



Helping farmers put soil health numbers in context: Benchmark Study Farm Reports



Farmer-to-Farmer Collaborative Problem Solving:

Minimize tillage; low/no-till

- Frustration terminating catch
 - using winter kill/covers, rolled hay
 - disc & cultipacker (light touch) instead of diskrippers
- Voles a real challenge
- T-plant → using a cutting disc to make planting strip for the wheel
- No till rotation arise from soil health aspirations
- Looking at non-traditional cover crop spp
- Compost strips over rolled crop
 - some concern over weed seed in compost
- Using a tarp/fabric b/w rows
- Moving years then deal? reg. rot. issues

1- Minimizing fertility inputs (closing the loop)

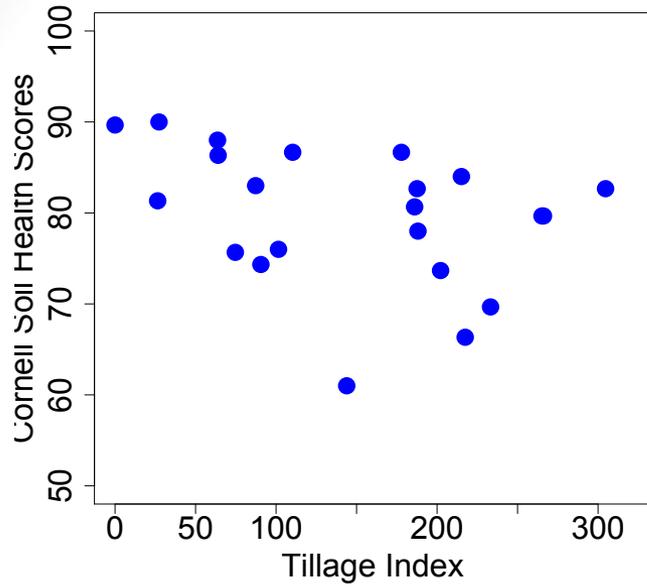
- Flexibility in crop rotation (based on what soil wants, in addition to what you want)
- Livestock inc. observationally benefit the veg crops
- Importing chicken manure (organic) was to heavy use over for manure collection into mulched compost
- Bring aware of tools agencies such as Conservation Districts have avail to rent

~~challenges~~

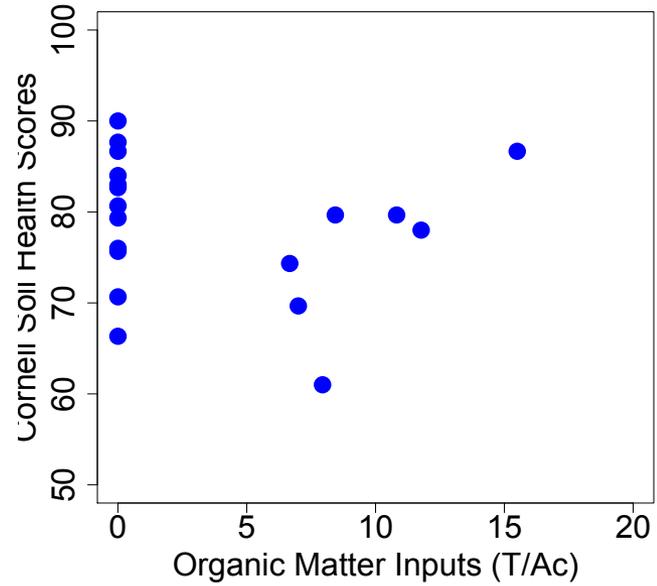
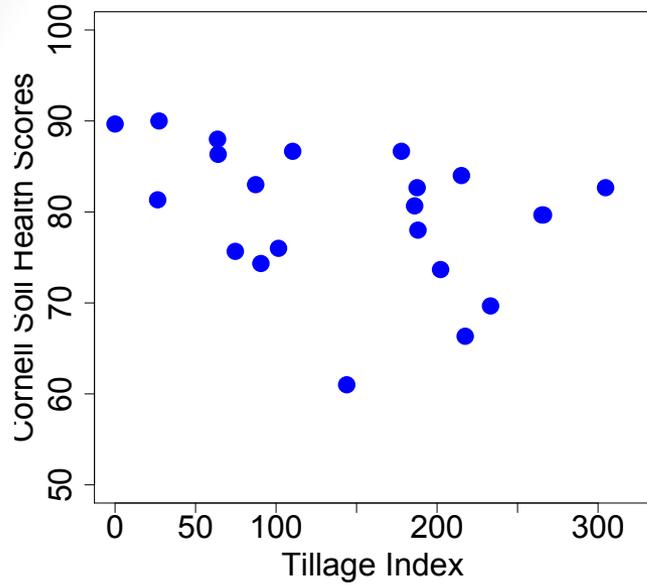
2- Integrate Livestock w/ Veg production

- working with weeds
- livestock rotation (nutrients)
- Chickens (persistence)
 - remove from seeding mix → killing that seed
- Following cattle w/ chickens for waste incorporation
 - diversity in grazier species
 - Older hens (single for pasture mgmt)
- Mowing (or inc. stacking clarity)
 - clipping
- Longer livestock rotation to take adv. of pasture enrichment, m.n. transition shock
- having pigs (rodes)
- Challenges of housing/winter livestock areas (impacts on ground, mging potential run-off)

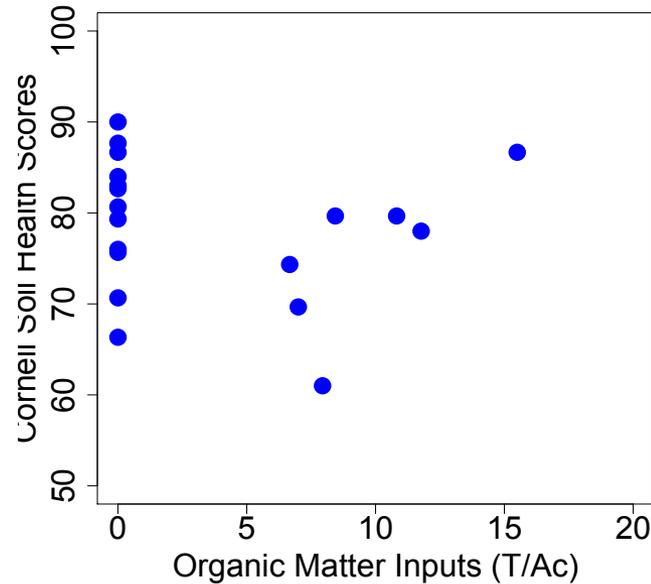
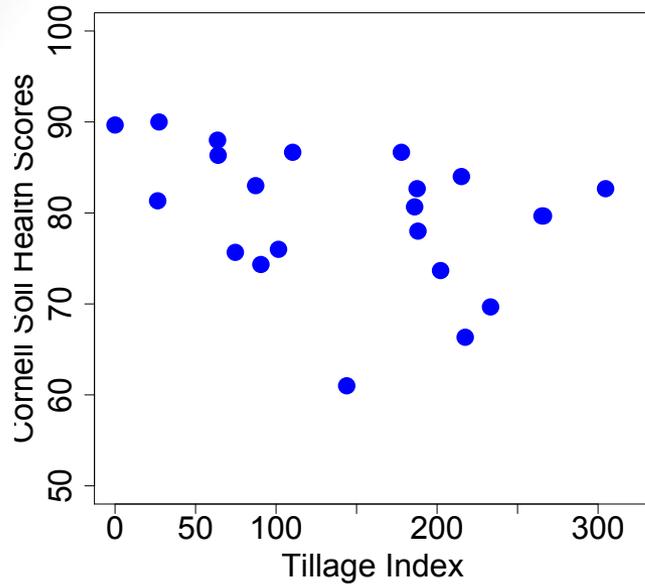
PASA Indicators: Many Different Paths to Soil Health



PASA Indicators: Many Different Paths to Soil Health



PASA Indicators: Many Different Paths to Soil Health



TWO BROAD STRATEGIES FOR OPTIMAL SOIL HEALTH:

1. *Healthy Crops, Healthy Soils:*

Intensive crop and cover crop schedules, carefully balanced amendments.

2. *Rest and Recover:*

2-4 years of vegetable production, 1-2 years of pasture, hay, or fallow.